

### **REMARKS**

Claims 1, 17-27 are pending. Independent claims 1 and 18 are amended herein to replace "comprising" with "consisting essentially of." No new matter has been added.

#### **Rejection Under 35 U.S.C. § 103(a)**

The Examiner asserted that claims 1 and 17-26 are unpatentable over Mueller et al. ("Mueller," U.S. 5,958,288) in view of Ernst (3,869,401) under 35 U.S.C. § 103(a). At least in view of the amendment herein to independent claims 1 and 18, Applicants respectfully disagree.

As amended herein, independent claims 1 and 18 recite, *inter alia*, an anisotropic copper etching agent consisting essentially of potassium hydrogen peroxomonosulfate having a concentration within a range of about 0.08 to about 2.0 mol/l, and acetic acid in a range of about 10 wt.% to about 75 wt.% relative to the potassium hydrogen peroxomonosulfate. The references cited by the Examiner, either alone or in combination, do not teach or suggest an anisotropic copper etching agent that satisfies the limitations of the independent claims. Mueller discloses a chemical mechanical polishing (CMP) composition comprising an oxidizing agent such as  $\text{KHSO}_5$  and at least one catalyst, such as ferric nitrate. (col. 3, lines 10-11 and col. 6, line 1) Mueller further teaches the inclusion of metal oxide abrasives and the use of acetic acid as an additive to "stabilize[s] the oxidizer in the presence of the metal complex." (col. 7, lines 43-45). Clearly, Mueller does not teach or suggest the use of an anisotropic copper etching agent consisting essentially of potassium hydrogen peroxomonosulfate and acetic acid. Ernst teaches the use of stabilizers such as phenol in an acetic acid solution that contains hydrogen peroxide. (abstract, col. 3, lines 44-49) There is no disclosure anywhere in Ernst of potassium hydrogen peroxomonosulfate, much less any teaching or suggestion of an anisotropic copper etching agent consisting essentially of potassium hydrogen peroxomonosulfate and acetic acid.

Since the references cited by the Examiner, either alone or in combination, do not teach or suggest an anisotropic copper etching agent that satisfies the limitations of

the independent claims, a *prima facie* case of obviousness cannot be established. Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 1 and 17-26 under 35 U.S.C. § 103(a).

The Examiner further asserted that claims 1 and 17-26 are unpatentable over Condra et al. ("Condra," U.S. 5,259,979) in view of Kubotera et al. ("Kubotera," 4,297,436) and Ernst (3,869,401) under 35 U.S.C. § 103(a). At least in view of the amendment herein to independent claims 1 and 18, Applicants respectfully disagree.

As amended herein, independent claims 1 and 18 recite, *inter alia*, an anisotropic copper etching agent consisting essentially of potassium hydrogen peroxomonosulfate having a concentration within a range of about 0.08 to about 2.0 mol/l, and acetic acid in a range of about 10 wt.% to about 75 wt.% relative to the potassium hydrogen peroxomonosulfate. The references cited by the Examiner do not teach or suggest an anisotropic copper etching agent that satisfies the limitations of the independent claims. The microetch cleaning composition disclosed by Condra includes a metal salt oxidizing agent such as ferric chloride or potassium dichromate (abstract, col. 8, lines 4 and 40-41) and a pH control agent in an aqueous solution. (col. 5, lines 41-44) Acetic acid is not disclosed, and potassium hydrogen peroxomonosulfate is not a component of the microetch cleaning composition. Kubotera discloses etch bleaching solutions that include an oxidizing agent such as peroxodisulfates, a metal salt, and acetic acid. (col. 13, lines 22-35) There is no disclosure anywhere in Condra or anywhere in Kubotera of an anisotropic copper etching agent consisting essentially of potassium hydrogen peroxomonosulfate and acetic acid.

Since the references cited by the Examiner, either alone or in combination, do not teach or suggest an anisotropic copper etching agent that satisfies the limitations of the independent claims, a *prima facie* case of obviousness cannot be established. Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 1 and 17-26 under 35 U.S.C. § 103(a).

**Patentability of New Claim 27**

New claim 27 recites an aqueous etching agent consisting essentially of potassium hydrogen peroxomonosulfate having a concentration within a range of about 0.08 to about 2.0 mol/l, and acetic acid, wherein the acetic acid is within a range of about 10 wt.% to about 75 wt.% relative to the potassium hydrogen peroxomonosulfate. For at least the reasons presented above, Applicants believe that this claim is patentable over the prior art cited by the Examiner.

**SUMMARY**

Applicants believe that pending claims 1 and 17-27 are in condition for allowance. The Examiner is invited to contact the undersigned agent for Applicants via telephone if such communication would expedite the allowance of the pending claims.

Respectfully submitted,



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